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ⓘ BATTERY FLAGS DESCRIPTION

by **staceygeek** » Wed Oct 12, 2016 8:36 am

I hope the info below gives somebody better understanding of the matters. Enjoy!!!

Manufacturer Status

FET1, FET0— Indicates the state of the charge and discharge FETs
0,0 = Both charge and discharge FETs are on.
0,1 = CHG FET is off, DSG FET is on.
1,0 = Both charge and discharge FETs are off.
1,1 = CHG FET is on, DSG FET is off.
PF1, PF0— Indicates permanent failure cause when permanent failure is indicated by STATE3..STATE0
0,0 = Fuse is blown if enabled via DF:Configuration:Register(64):Permanent Fail Cfg 1..2(6..8)
0,1 = Cell imbalance failure
1,0 = Safety voltage failure
1,1 = FET failure
STATE3, STATE2, STATE1, STATE0— Indicates the battery state.
0,0,0,0 = Wake Up
0,0,0,1 = Normal Discharge
0,0,1,1 = Pre-Charge
0,1,0,1 = Charge
0,1,1,1 = Charge Termination
1,0,0,0 = Fault Charge Terminate
1,0,0,1 = Permanent Failure
1,0,1,0 = Overcurrent
1,0,1,1 = Overtemperature
1,1,0,0 = Battery Failure
1,1,0,1 = Sleep
1,1,1,0 = Discharge Prohibited
1,1,1,1 = Battery Removed

BatteryMode

CapM— Sets the units used for capacity information and internal calculation.

0 = Reports in mA or mAh (default)

1 = Reports in 10 mW or 10 mWh

The following functions are instantaneously updated after a [CapM] change:

SBS:RemainingCapacityAlarm(0x01)

SBS:AtRate(0x04)

SBS:RemainingCapacity(0x0f)

SBS:FullChargeCapacity(0x10)

SBS:DesignCapacity(0x18)

The following functions are recalculated within 1 second after a [CapM] change:

SBS:RemainingTimeAlarm(0x02)

SBS:AtRateTimeToEmpty(0x06)

SBS:AtRateOK(0x07)

SBS:RunTimeToEmpty(0x11)

SBS:AverageTimeToEmpty(0x12)

SBS:BatteryStatus(0x16)

ChgM— Enables or disables the chip transmission of ChargingCurrent and ChargingVoltage messages to the Smart Battery Charger.

0 = Enable ChargingVoltage and ChargingCurrent broadcasts to the Smart Battery Charger by setting the [BCAST] bit in Operation Cfg B when charging is desired.

1 = Disable ChargingVoltage and ChargingCurrent broadcasts to the Smart Battery Charger. (default)

AM— Enables or disables AlarmWarning broadcasts to the host and Smart Battery Charger

0 = Enable AlarmWarning broadcast to host and Smart Battery Charger by setting the [BCAST] bit in Operation Cfg B (default). The chip sends the AlarmWarning messages to the SMBus Host and the Smart Battery Charger any time an alarm condition is detected.

1 = Disable AlarmWarning broadcast to host and Smart BatteryCharger. The chip does not master the SMBus, and AlarmWarning messages are not sent to the SMBus Host and the Smart Battery Charger for a period of no more than 65 seconds and no less than 45 seconds. [AM] is automatically cleared by the chip 60 seconds after being set to 1, independent of the [BCAST] bit.

PB— Sets the role of the battery pack. This flag is not used by the chip and should be set to 0.

CC— Enable or disable internal charge controller. This flag is not used by chip and should be set to 0.

CF— This flag is set if MaxError > CF MaxError Limit

0 = Battery OK

1 = Condition cycle requested

PBS— Primary battery support is not supported by chip and is fixed to 0.

ICC— This flag indicates whether the internal charge controller function is supported or not. This value is fixed to 1.

BatteryStatus

OCA— 1 = Over Charged Alarm

TCA— 1 = Terminate Charge Alarm

OTA— 1 = Over Temperature Alarm

TDA— 1 = Terminate Discharge Alarm

RCA— Remaining Capacity Alarm

1 = Remaining Capacity Alarm is set

RTA— Remaining Time Alarm

1 = Remaining Time Alarm is set

INIT— 1 = Initialization. The INIT flag is always set in normal operation.

DSG— Discharging

0 = chip is in charging mode

1 = chip is in discharging mode or relaxation mode, or valid charge termination has occurred.

FC— 1 = Fully Charged

FD— 1 = Fully Discharged

EC3, EC2, EC1, EC0— Error Code, returns status of processed SBS function

0,0,0,0 = OK chip processed the function code with no errors detected.

0,0,0,1 = BUSY chip is unable to process the function code at this time.

0,0,1,0 = Reserved chip detected an attempt to read or write to a function code reserved by this version of the specification, or chip detected an attempt to access an unsupported optional manufacturer function code.

0,0,1,1 = Unsupported chip does not support this function code as defined in this version of the specification.

0,1,0,0 = AccessDenied chip detected an attempt to write to a read-only function code.

0,1,0,1 = Over/Underflow chip detected a data overflow or underflow.

0,1,1,0 = BadSize chip detected an attempt to write to a function code with an incorrect data block.

0,1,1,1 = UnknownError chip detected an unidentifiable error.

FETControl

OD— AFE GPOD pin control

0 = Disable GPOD pin (high-Z)

1 = Enable GPOD pin (open drain)

ZVCHG— Zero-volt (pre-charge) charge FET control

0 = Turn OFF pre-charge FET

1 = Turn ON pre-charge FET

CHG— Charge FET Control

0 = Turn OFF CHG FET. CHG FET does not turn off in discharge mode to protect the FET body diode.

1 = Turn ON CHG FET

DSG— Discharge FET Control

0 = Turn OFF DSG FET. It does not turn off in charge mode to protect the FET body diode.

1 = Turn ON DSG FET

Operation Status

CLL— (Cell Life Limit) 1 = Capacity of the pack fallen below Cell Life Limit threshold

DetW— (Deterioration Warning) 1 = Capacity of the pack fallen below Deterioration Warn Limit threshold

DetF— (Deterioration Fault) 1 = Capacity of the pack fallen below Deterioration Fault Limit threshold

SafetyStatus

OT1D— 1 = Discharge overtemperature on TS1 condition

OT1C— 1 = Charge overtemperature on TS1 condition

OCD— 1 = Discharge overcurrent condition

OCC— 1 = Charge overcurrent condition

OCD2— 1 = Discharge overcurrent condition 2

OCC2— 1 = Charge overcurrent condition 2

CUV— 1 = Cell undervoltage condition

COV— 1 = Cell overvoltage condition

PF— 1 = Permanent failure condition.

WDF— 1 = AFE watchdog condition

AOCD— 1 = AFE discharge overcurrent condition

SCC— 1 = Charge short-circuit condition

SCD— 1 = Discharge short-circuit condition

PFStatus

SUV— 1 = Safety Undervoltage permanent failure
SOCD— 1 = Discharge Safety Overcurrent permanent failure
SOCC— 1 = Charge Safety-Overcurrent permanent failure
AFE_P— 1 = Periodic AFE Communications permanent failure
AFE_C— 1 = Permanent AFE Communications failure
DFF— 1 = Data Flash Fault permanent failure
DFETF— 1 = Discharge-FET-Failure permanent failure
CFETF— 1 = Charge-FET-Failure permanent failure
CIM_R— 1 = Cell-Imbalance (At Rest method) permanent failure
SOT1D— 1 = Discharge Safety Overtemperature on TS1 permanent failure
SOT1C— 1 = Charge Safety Overtemperature on TS1 permanent failure
SOV— 1 = Safety-Overvoltage permanent failure
PFIN— 1 = External Input Indication of permanent failure

OperationStatus

PRES— 1 = PRES is low, indicating that the system is present (battery inserted).
FAS— 0 = Full access security mode
SS— 1 = Sealed security mode
CSV— 1 = Data flash checksum value has been generated
LDMD— Load mode for Impedance Track modeling. 0 = constant current, 1 = constant power
WAKE— 1 = bq20z40-R1/bq20z45-R1 WAKE mode
DSG— Replica of the SBS:BatteryStatus(0x16)[DSG] flag.
XDSG— 1 = Discharge fault
XDSGI— 1 = Discharge disabled due to a current issue
DSGIN— 1 = Discharge inhibited due to a high temperature issue
R_DIS— 1 = Ra Table resistance updates are disabled
VOK— 1 = Voltages are OK for a QMAX update
QEN— 1 = QMAX updates are enabled

ChargingStatus

XCHG— 1 = Charging disabled
CHGSUSP— 1 = Charging suspended
PCHG— 1 = Precharging
MCHG— 1 = Maintenance charging
LTCHG— 1 = Low temperature charging
ST1CHG— 1 = Standard temperature charging 1
ST2CHG— 1 = Standard temperature charging 2
HTCHG— High temperature charging
CB— 1 = Cell balancing in progress
OC— 1 = Overcharge fault

SafetyStatus2

OT2D— 1 = Discharge overtemperature condition on TS2
OT2C— 1 = Charge overtemperature condition on TS2

PFStatus2

CIM_A— 1 = Cell-Imbalance (Active method) permanent failure

SOT2D— 1 = Discharge Safety Overtemperature on TS2 permanent failure
SOT2C— 1 = Charge Safety Overtemperature in TS2 permanent failure

Permanent Fail Cfg 1

XPFVSHUT— If this bit is set AND any permanent failure happens AND the bq20z40-R1/bq20z45-R1 goes into shutdown, the SAFE pin is driven high.
XSUV— If this bit is set AND a safety undervoltage permanent failure occurs, the SAFE pin is driven high.
XSOCD— If this bit is set AND a discharge safety overcurrent permanent failure occurs, the SAFE pin is driven high.
XSOCC— If this bit is set AND a charge safety overcurrent failure occurs the SAFE pin is driven high.
XAFE_P— If this bit is set AND a periodic AFE-communications permanent failure occurs, the SAFE pin is driven high.
XAFE_C— If this bit is set AND an AFE-communications permanent failure occurs, the SAFE pin is driven high.
XDFF— If this bit is set AND a Data Flash Fault permanent failure occurs, the SAFE pin is driven high.
XDFETF— If this bit is set AND a DSG FET permanent failure occurs, the SAFE pin is driven high.
XCFETF— If this bit is set AND a CHG FET permanent failure occurs, the SAFE pin is driven high.
XCIM_R— If this bit is set AND a cell imbalance permanent failure occurs, the SAFE pin is driven high.
XSOT1D— If this bit is set AND safety over temperature on TS1 during discharge failure occurs the SAFE pin is driven high.
XSOT1C— If this bit is set AND safety over temperature on TS1 during charge failure occurs the SAFE pin is driven high.
XSOV— If this bit is set AND a safety overvoltage permanent failure occurs, the SAFE pin is driven high.
XPFIN— If this bit is set AND an external input indication permanent failure occurs, the SAFE pin is driven high.

Permanent Fail Cfg 2

XSOT2D— If this bit is set AND safety over temperature on TS2 during discharge failure occurs the SAFE pin is driven high.
XSOT2C— If this bit is set AND safety over temperature on TS2 during charge failure occurs the SAFE pin is driven high.
XCIM_A— If this bit is set AND a cell imbalance while active permanent failure occurs, the SAFE pin is driven high.

Non-Removable Cfg

OCD— Overcurrent in Discharge
OCC— Overcurrent in Charge
AOCD— AFE Overcurrent in Discharge
ASCC— Short Circuit in Charge
ASCD— Short Circuit in Discharge

Saved PF Flags 1

PFVSHUT— 1 = Another permanent failure has occurred AND the device went into shutdown after that event
SUV— 1 = Safety Undervoltage permanent failure
SOCD— 1 = Safety Overcurrent in Discharge permanent failure
SOCC— 1 = Safety Overcurrent in Charge permanent failure

AFE_P— 1 = Periodic AFE-Communications permanent failure

AFE_C— 1 = AFE-Communications permanent failure

DFF— 1 = Data Flash Fault permanent failure

DFETF— 1 = Discharge FET permanent failure

CFETF— 1 = Charge FET permanent failure

CIM— 1 = Cell-Imbalance permanent failure

SOTD— 1 = Discharge Safety Overtemperature permanent failure

SOTC— 1 = Charge Safety Overtemperature permanent failure

SOV— 1 = Safety Overvoltage permanent failure

PFIN— 1 = External PFIN Input Indication of a permanent failure

SOT2D— 1 = Safety over temperature on TS2 during discharge failure

SOT2C— 1 = Safety over temperature on TS2 during charge failure

CIM_A— 1 = Cell imbalance while active permanent failure